

MEMORANDUM FOR: SEE DISTRIBUTION

28 June 1996

SUBJECT: MRCI PDR Minutes

1. The Modular Reconfigurable C4I Interface (MRCI) Preliminary Design Review (PDR) was conducted on 11 June 1996 at the Ramada Inn in Arlington, Virginia. [NOTE THE CHANGE IN THE CDR DATE IN PARA 7C BELOW.]

a. The purposes of the meeting were to:

- Provide preliminary design review of MRCI
- Identification of Computer Software Configuration Items (CSCI)
- Identification of Computer Software Components (CSC)
- Provide overview of MRCI Architecture
- Allocation of Requirements to CSCI & CSC
- Gain understanding of functionality within experiment context

b. The objectives of the meeting were to:

- Briefly review high level requirements
- Receive community input on preliminary MRCI design
- Identify and discuss key design issues

2. The meeting agenda included:

- Welcome and Introduction
- MRCI Background and PDR Objectives
- Programmatic Issues
- MRCI General and Technical Requirements Review
- Mission Threads by Experiment
- MRCI Requirements Allocation to Functions
- MRCI Preliminary Design Overview
- System Specific Interfaces
- Reconfigurable Modules
- RTI Interface
- Experiment Level Functional String Walkthrough
- MRCI Graphical User Interface Concept
- MRCI External Interface Characterizations
- Systems Engineering Management Plan Update
- Summary and Wrap Up

The meeting was co-chaired by Lt. Col. Mark Jefferson, Defense Modeling and Simulation Office (DMSO), Chief Technology Division, and by Mr. Tom Tiernan (NRaD), the MRCI Program Manager, and agent for DMSO.

3. Lt. Col. Jefferson opened the meeting by defining the MRCI PDR purposes and objectives. He then reviewed the MRCI program. Lt. Col. Jefferson specifically responded to the following questions raised by the Air Force during the System Requirements Review.

*Will the MRCI become a DoD mandated requirement?*

- No, only HLA compliance is specified in the DoD M&S Master Plan
- However, in order for C4I systems to communicate with DoD simulations, an HLA compliant interface is required
- MRCI provides such an interface and will be available as shareware

*What is the MRCI Configuration Management (CM) Plan?*

- Assuming success of MRCI prototype,...
- DMSO in conjunction with MRCI PM will be responsible for, and provide, CM of the common modules of the MRCI
- Periodic CM meetings will be convened to determine appropriate additions, deletions, or modifications to SW and DOC

*Who pays for legacy model conversion costs?*

- This is not an MRCI issue
- Services are responsible for making simulations HLA compliant [NOTE: If MRCI prototype is successful, MRCI will ultimately provide a toolset to support HLA interfaces for C4I systems; it is responsibility of C4I system to use MRCI (or another interface) to support use of C4I systems with simulation]

*Who will provide what type of documentation for the MRCI?*

- During prototype, DMSO will make MRCI progress reports available
- If MRCI prototype is successful, DMSO in conjunction with MRCI PM will be responsible for, and provide, documentation for MRCI
- Such documentation may include: design documentation, source code, troubleshooting, and user manual

*Who performs VV&A on the MRCI?*

- MRCI prototype verification will be accomplished by DMSO/PM
- If successful,...
- MRCI toolset Verification - DMSO/PM
- MRCI/C4I package Validation - C4I system PM
- MRCI/C4I package Accreditation - C4I system PM
- Federation Accreditation - DoD user

4. Tom Tiernan briefed the Program Management aspects of the MRCI. Mr. Tiernan stepped through each phase of the development process to include evolution of the MRCI. He articulated potential MRCI evaluation criterion and identified key issues including investment and acquisition strategies. Mr. Tiernan concluded with discussion of a proposed workshop to develop the details of the 1996 MRCI prototype tests. Additionally, he reiterated NRAD's intent to visit the Services/Agencies and hold additional discussions concerning future MRCI requirements.

5. SAIC, the integrating contractor for the MRCI, then briefed the details of the MRCI PDR to include:

- a. A review of the MRCI requirements previously briefed and refined at the System Requirements Review (SRR).

The only requirement soliciting significant discussion was #1: "MRCI execution should be transparent to the user and non-intrusive to the C4I system during setup and use." The discussion focused on Army concerns that a C4I system operator would have to push a software 'button' on the screen selecting simulation and the MRCI during exercise setup. Although this will continue to be studied during the design phase, the approach being followed will comply with the GCCS DII COE.

b. A review of the MRCI experiments including:

(1) a technical discussion concerning the MRCI message fabrication process from the last Interim Technical Interchange Meeting on May 23, 1996. The integrating contractor presented the different design alternatives and the conclusion from the meeting that the fabrication process should be located as part of the MRCI, although for the experiments, an MRCI test cell may be utilized.

(2) the four missions threads corresponding to the MRCI experiments.

Experiment # 1 - CTAPS/TBMCS to AWSIM/R  
Experiment # 2 - CTAPS/TBMCS to AFSAF  
Experiment # 3 - MCS/P to AFATDS to CBS  
Experiment # 4 - MCS/P to AFATDS to ARSAF

c. MRCI Requirements Allocation to Functions.

(1) the CTAPS version 5.2 message set proposed for use in the MRCI Air Experiments.

(2) the FATDS message set proposed for use in the Army Experiments.

(3) a cross reference of VMF to TACFIRE messages proposed for use in the Army Experiments.

d. MRCI Configuration Items Functional Design.

(1) MRCI General and Technical Requirements Allocation Matrix indexing each requirement to the applicable CSCIs and the CSCs.

(2) MRCI design of the SSI discussing a possible approach to implementing the communications module by utilizing an existing communications emulation interface called the Tactical Communications Interface Module (TCIM).

(3) MRCI design of the reconfigurable module describing executive components to include a Knowledgeable Populator, a Knowledgeable Configurer and a Knowledgeable Connector. The following proposed reconfigurable modules were identified:

Message and Datalink Transactions	SWID
AAS Interpreter	MODU_AINT
AAS Fabricator	MODU_AFAB
CCSIL Interpreter	MODU_CINT

CCSIL Fabricator	MODU_CFAB
TACFIRE Interpreter	MODU_TINT
TACFIRE Fabricator	MODU_TFAB
TADIL A,B Interpreter	MODU_TADINT
TADIL A,B Fabricator	MODU_TADFAB
USMTF Interpreter	MODU_UINT
USMTF Fabricator	MODU_UFAB
VMF Interpreter	MODU_VINT
VMF Fabricator	MODU_VFAB
Other Technical Functions	SWID
Live/Exercise Differentiation/Labeling	MODU_LEDIF
SOM Physical Attribute Value Sustainment	MODU_PAVS
SOM Temporal Accuracy Sustainment	MODU_TAS
MRCI Data Server	MODU_DS
MRCI Information Server	MODU_IS
MRCI C2 Server	MODU_C2S
Communication Services Restrictions	MODU_CSR
High Time-Bandwidth Product Handler	MODU_HTBPH

(4) the MRCI design of the Run Time Infrastructure Interface (RTII) CSCI stating that the development of this module is dependent upon the development of the RTI.

e. MRCI Functional String SSI Logic Flow (CTAPS-to-AWSIM/R).

The data, information, and C2 transformations and flows for the first experiment. These diagrams indicated the functional flow of data, information, and command interactions within the software that comprise the actual middleware product between the CTAPS and AWSIM/R. These diagrams indicate the lowest level of system to system interaction by portraying the message interaction between the live and simulated systems.

f. MRCI Graphical User Interface Concept.

An example of how the SSI GUI could be reached via a DII COE Desktop.

g. MRCI External Interface Characterizations.

Review of the external interfaces between the SSI and the RTII of the MRCI and provisions to bypass the RTI for High Time-Bandwidth Product Transactions.

h. System Engineering Management Plan Update and Program Activities Plan Review.

The proposed table of contents for the SEMP and review of the major program milestones in the Program Activities Plan.

6. Discussion/comments.

a. Communication degradation will be applied at the reception point. For example, SINGARS applies comm/network effects as they come in. These effects will be computed elsewhere (outside of the MRCI common modules) and applied by MRCI.

b. How will MRCI perform Time Management? The HLA manages time for the federation. SAIC has not really looked into this as of yet. Further review is required.

c. Will the MRCI CCSIL translator be common? The MRCI CCSIL translator will be common to the extent that the real world is common.

d. What happens to the ATO if there are format errors? It is sent back to CTAPS. This brought more discussion since this is not what would happen in a real world situation. For the experiments, the ATO will have to be rejected. In the future, incorrect format or missing data from CTAPS needs to be interpreted, otherwise this is unrealistic.

e. Problems with CTAPS 5.1 and processing USMTF messages exist and require CTAPS operator intervention to correct. Some of the experiments USMTF messages picked for testing will not work. Version 5.2 may not correct these since the next update to CTAPS is TBMCS which will change the internal data transfer/management methodology.

f. There was some discussion over placing a MRCI.SSI.API on the host C4I system since this may be intrusive. Source code should not require modification even with the addition of a MRCI API. SAIC commented that this method has worked successfully in the past and is considered non-intrusive. There was some discontent still and PMs of some C4I systems may not desire this. Also, what is the effect on the C4I systems Configuration Management? The Army noted that is not the current methodology they use for their simulation interfaces with their C4I systems. At this point, the PM noted NRaD/SAIC needs to re-look at the written requirements verse how the design is currently planned, note discrepancies, then analyze the discrepancies.

g. Will MRCI demonstrate communication degradation from jamming and LOS comm loss during the experiments? Yes.

h. The set of MRCI common modules presented at the PDR is the minimum subset to make MRCI capable of performing the experiments.

7. Follow on events include:

a. MRCI Informal Technical Interchange to be held prior to Critical Design Review (CDR)  
-- TBD Jul 96 at SAIC McLean -- ACTION POC -- MRCI PM

b. Individual requirements discussions between MRCI PM and Services/Programs --  
TBD Jul 96 -- ACTION POC -- MRCI PM

c. MRCI CDR -- 14 Aug 96 -- 0800-1700 -- The CDR will be held in the Ramada Inn ballroom at 4641 Kenmore Ave, Alexandria, VA 22304 (703-751-4510). Directions to this Ramada are:

--- exit 395 at Seminary eastbound

--- proceed to the stoplight at Library Lane and turn left

- proceed one-half block and turn left in front of the Crestar Bank
- proceed one-half block to Kenmore and the Ramada is across the street

8. ACTION POC -- DMSO MRCI POC.

9. All documentation for the PDR will be posted on the DMSO web site at <http://www.dmsomil/projects/hla/mrci/>. DMSO MRCI POC is Lt Col Mark Jefferson, 703-998-0660, [mjeffers@dmsomil](mailto:mjeffers@dmsomil).

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